Eucalyptus series *Preissianae* (Myrtaceae), a new series of Western Australian eucalypts and the description of a new subspecies in the series

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Abstract

Brooker, M.I.H. and Slee, A.V. *Eucalyptus* ser. *Preissianae* (Myrtaceae), a new series of Western Australian eucalypts and the description of a new subspecies in the series. Nuytsia 10 (1): 7-13 (1995). A new taxon, *Eucalyptus* ser. *Preissianae*, comprising subser. *Pluriloculares* Blakely and *Glandulares* Blakely, and a new taxon, *E. preissiana* subsp. *lobata* are described, accompanied by illustrations and a distribution map.

Introduction

Eucalyptus preissiana Schau. was published in 1844 and *E. megacarpa* F. Muell. in 1860. Both were placed in the heterogeneous subseries *Robustae* by Bentham (1867), a taxon apparently named from the large flowers, thick pedicels and thick leaves. While the species were placed in succession, Bentham made no mention of affinities.

Maiden (1913) recognized the natural affinity of *E. preissiana* with *E. megacarpa* (and *E. cosmophylla* F. Muell. and *E. globulus* Labill. which must be disregarded in this context), following which, Blakely (1934) placed the two species in consecutive monotypic subseries, *Pluriloculares* and *Glandulares* respectively. Blakely was apparently unaware of the publication of *E. coronata* Gardner in 1931, although this species was included in a reprinting of Blakely's "Key to the Eucalypts" in 1955 in subser. *Glandulares* with *E. megacarpa*.

The diagnoses for the subseries *Pluriloculares* and *Glandulares* contrast only the characters habit and bud shape. Blakely's assertion that the staminal filaments of *E. megacarpa* are glandular with no corresponding comment regarding *E. preissiana* is misleading as all four species of the series have glandular filaments. Nevertheless, the subseries indicate the true division in the series based on the more reliably diagnostic characters seed colour and shape, flower colour and leaf ontogeny as shown below.

While Blakely's recognition of the affinity between the two species has been upheld by all subsequent authors, Carr & Carr (1962) demonstrated his incorrect placement of them in section *Macrantherae* and that they belonged to the renantherous group of eucalypts (*Monocalyptus* in Carr & Carr's terminology, a group generally referred to as the monocalypts).

The subsequently published *E. aquilina* Brooker (1974) also belongs with *E. preissiana, E. coronata* and *E. megacarpa* and the four species constitute a taxonomic series. This was recognized by Pryor & Johnson (1971) who segregated the only three species published to the time in an extra-codical series *Preissianae*.

By 1971 only twelve Western Australian *Monocalyptus* species had been published. In the following fifteen years eleven more species were published. Some of these obviously did not fit into any known classification. Consequently, a revised, necessarily enlarged classification for the Western Australian monocalypts was required. This was provided informally by Ladiges, Humphries & Brooker (1986) as result of their cladistic analyses of all the species involved.

The system comprised two sections divided ultimately into twelve taxonomic series (some by implication, e.g. the monotypic subsection *Patens* consisting of *E. patens* is not divided into taxa between subsection and species), one of which was the "*Preissianinae*". The series was split into two subseries, "*Coronatitae*" (*E. megacarpa, E. coronata* and *E. aquilina)* and *"Preissianitae"* (*E. acies* and *E. preissiana*).

We now reject the alliance in Ladiges, Humphries & Brooker of *E. acies* with *E. preissiana* on the grounds of its (1) reflexed not erect inflorescences, (2) 7- not 3-flowered inflorescences, (3) much smaller buds and fruits, (4) non-glandular filaments of the stamens, (5) incurved not longitudinal dehiscence slits of the anthers, (6) annular not lobed disc of the fruit and (7) number of valves of the fruit predominantly 3 or 4 not 5-7, and agree with the suggestion of Ladiges (pers. comm.) that *E. acies* might be better placed at the base of the clade.

Of the four closely related species, *E. preissiana* is the most divergent, with *E. megacarpa* also somewhat distant from the closely related pair, *E. coronata* and *E. aquilina*.

Chippendale (1988) placed the *preissiana* group of species with the monocalypts in ser. *Diversiformes*. This series is heterogeneous and bears no relationship to the classification published two years previously by Ladiges *et al.* and, as constituted, should be disregarded.

In this paper we formally establish the taxonomic series comprising the *preissiana* group of species and recognize the natural division within it.

Seedling studies

Without reference to other species, Maiden (1913) remarked that the juvenile foliage of *Eucalyptus megacarpa* was not "glandular-hairy" and later (1930) referred to the "stellate" hairs of the juvenile leaves of *E. preissiana*.

In the study by Ladiges *et al.* (1987) the seedlings of all the species concerned were assessed for various morphological features. The presence or absence of verrucae on the seedling stems was not

determined, but *E. preissiana* was considered unique as the only species with hairs on the cap cells of emergent oil glands.

In a smaller seedling study undertaken for the purposes of this paper, we have found "warts" or "hairs" on the seedling stems of all of the above species. It was confirmed that *E. preissiana* had the indumentum described by Ladiges *et al.* (Figure 1A). Verrucae were found to be poorly developed in *E. megacarpa* (Figure 1B), but in *E. aquilina* (Figure 1C) and *E. coronata*, they show greater development in having a distinct apical group of cells, obviously an incipient condition of the emergent oil glands with elongated apical cells of *E. preissiana*.

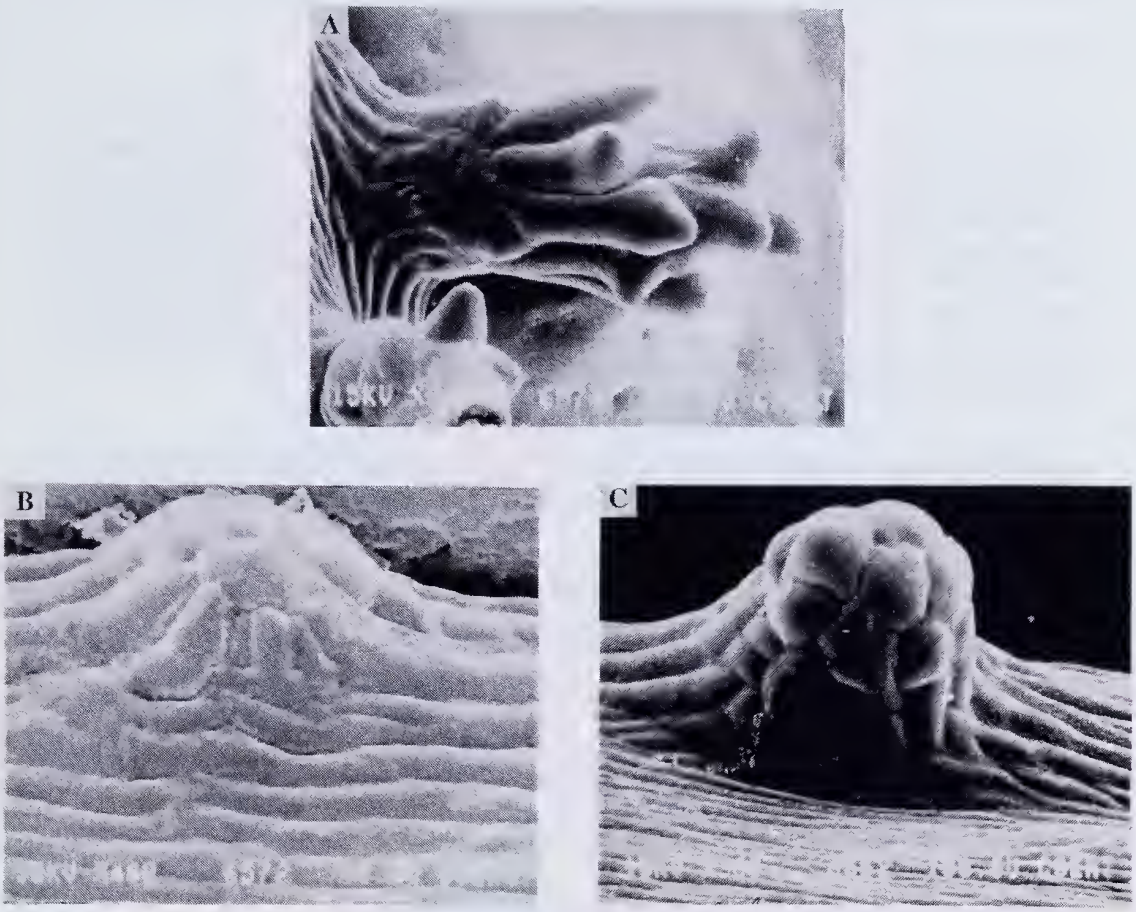

Figure 1. A. Typical emergent oil gland on the seedling stems of *E. preissiana* subsp. *preissiana* (*Brooker* 8932 (x260)); B. Typically well-developed wart on seedling stem of *E. megacarpa* (*Brooker* 5032 (x480)); C. Typical wart on seedling stem of *E. aquilina* (*Brooker* 7495 (x360)).

Taxonomy

Eucalyptus ser. **Preissianae** Pryor & Johnson ex Brooker & Slee, *ser. nov.*

Arbores vel frutices cortice laevi. Caules plantularum verrucosi vel pubescentes. Folia plantularum sessilia, opposita per 5-10 nodos. Inflorescentiae axillares, 3-floribus, in pedunculis robustis, complanatis. Alabastra fructusque magni. Filamenta staminum glandulifera. Antherae rimis longitudinalibus dehiscentes. Fructus plus minusve sessili, disco lobato et 4-7 valvis.

Informal *E.* ser. *Preissianae* Pryor & Johnson, "Classification of the Eucalypts" p. 39 (1971).

Informal *E.* ser. *Preissianinae* Ladiges, Humphries & Brooker, Aust. J. Bot. 35: 264 (1987), *pro parte maxima.*

E. ser. *Diversiformes* Blakely *sensu* Chippendale "Flora Australia" p. 123 (1988).

Type: E. preissiana Schauer

Trees or *mallees* with smooth bark. *Seedling stems* warty or with cap cells developing into hairs. *Seedling leaves* sessile, remaining opposite for 5-10 pairs, flat or undulate at the edges, broadly elliptical, non glaucous. *Adult leaves* alternate, petiolate, lanceolate to falcate, or remaining opposite to subopposite, shortly petiolate, elliptic to broad-lanceolate. *Inflorescences* axillary, unbranched, erect or pendulous; peduncles stout, flattened, 3-flowered. *Buds* ± sessile, large, smooth or ribbed, with a single operculum. *Stamens* oblique or inflexed, all fertile; filaments glandular. *Anthers* dorsifixed, strongly versatile, opening by longitudinal, non-confluent slits. *Ovules* in 2 vertical rows. *Flowers* white or yellow. *Fruit* ± sessile, large, obconical or cupular; disc broad, shiny red-brown when fresh, annular or obliquely descending, smooth or with gross lobes over the valves; valves 4-7. *Seed* black or brown, D-shaped or subpyramidal, with large, terminal, hilum.

Distribution. Western Australia. Coastal and subcoastal from south-east of Perth (*E. megacarpa*) almost to Thistle Cove east of Esperance (*E. aquilina*), including Sandy Hook Island in Esperance harbour. (Figure 2)

Key to subseries

1. Seed black, highly irregular, somewhat pyramidal; crown of lanceolate or falcate adult leaves; seedling stems warty, but lacking hairs; flowers white ..... subseries *Glandulares*
1. Seed brown or red-brown, regularly D-shaped and flattened; crown of elliptical to broadly lanceolate, juvenile or intermediate leaves; seedling stems with hairs on the cap cells of emergent oil glands; flowers yellow ..... subseries *Pluriloculares*

Eucalyptus subser. *Glandulares* Blakely, "Key Eucalypts" 35 (1934)

Type: E. megacarpa F. Muell.

Three species endemic to south-west Western Australia.

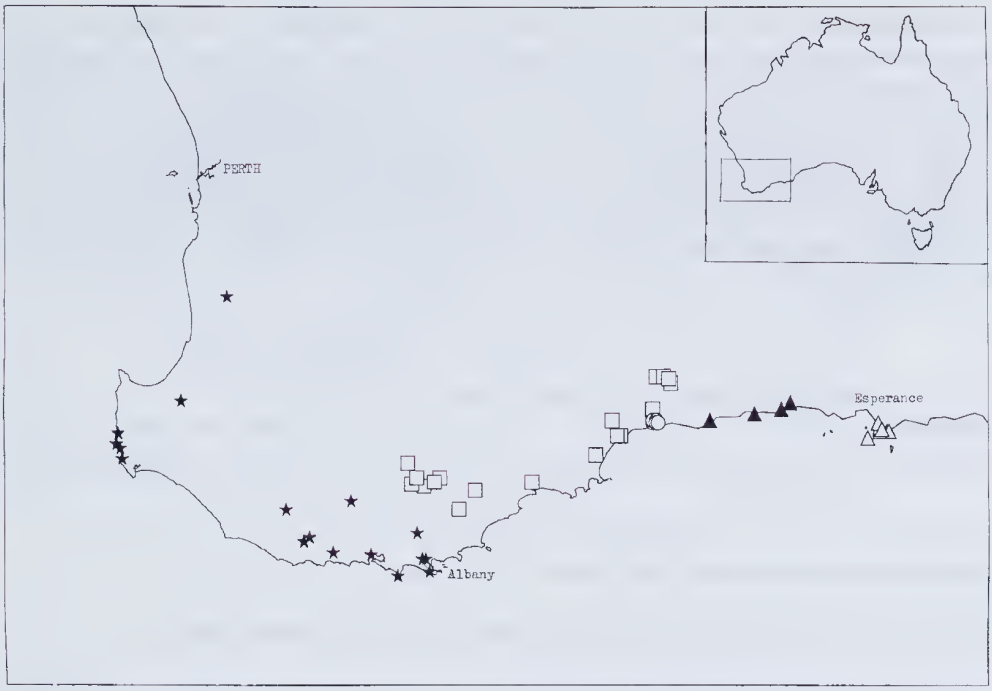

Figure 2. Distribution of *E.* ser. *Preissianae*. *E. megacarpa* (stars), *E. preissiana* subsp. *preissiana* (squares), *E. coronata* (circles), *E. preissiana* subsp. *lobata* (solid triangles), *E. aquilina* (open triangles).

Key to species

1. Buds and fruit strongly ribbed ..... *E. coronata*
1. Buds and fruit smooth
   2. Fruit with gross, protruding lobes of the disc ..... *E. aquilina*
   2. Fruit with annular or inward-sloping disc, lobes lacking or inconspicuous..... *E. megacarpa*

For full descriptions of these species see Brooker & Kleinig (1990: 94-96).

Eucalyptus subser. *Pluriloculares* Blakely, "Key Eucalypts" 35 (1934).

Type: E. preissiana Schauer.

A monotypic subseries.

A new subspecies in *E. preissiana*

Eucalyptus preissiana Schau. is a well-known, small eucalypt occurring in Western Australia from the Stirling Range eastwards almost to Esperance. With its low, thin-stemmed sprawling habit and large yellow flowers, it is a favourite ornamental (Brooker & Kleinig 1990).

Recent collections of *E. preissiana* in the eastern part of its distribution have brought to light the distinctive fruits of the form growing from the Starvation Boat Harbour road eastwards to Quagi Beach, east of Stokes Bay National Park. The fruits with their extreme, protruding lobes of the disc are indistinguishable from those of *E. aquilina* Brooker. Morphology is otherwise that for *E. preissiana* including seedling indumentum (see above) and persistence of juvenile/intermediate foliage on the mature plant. In addition, these plants in their easterly distribution become more depauperate. Along the road to Quagi Beach they grow in a pure stand on limestony dunes and barely exceed one metre in height. The flowers and fruit are held prominently at the tops of the shrubs. We treat this eastern form as a new subspecies.

Key to taxa

1. Fruit with inward-sloping disc, lacking lobes or lobes small and below rim level ..... *E. preissiana* subsp. *preissiana*
1. Fruit with gross, protruding lobes of the disc ..... 1. *E. preissiana* subsp. *lobata*

1. *Eucalyptus preissiana* subsp. *lobata* Brooker & Slee, *subsp. nov.* (Figures 1,2,3)

A subspecie typica habitu minori et fructibus lobis disci magnis protrusis differt.

It differs from the typical subspecies by the lower habit and the fruit with large protruding lobes to the disc.

Typus: 9.2 km along Farrell's Road from highway towards Quagi Beach, Western Australia, (33° 47'S, 121° 17"E), 25 November 1991, *M.I.H. Brooker* 10909 & *P.M. Grayling* (holo: CANB; iso: AD, NSW, PERTH).

Specimens examined. WESTERN AUSTRALIA: Fanny Cove, 27 Oct. 1963, *T.E.H. Aplin* 2650b (PERTH); *c.* 5 km south of Springvale Road on Starvation Boat Harbour road, 11 Apr. 1985, *M.I.H. Brooker* 8933 (CANB, MEL, NSW, PERTH); type locality, 25 Nov. 1991, *M.I.H. Brooker* 10910, 10911 (CANB); 14 km east of mouth of Oldfield River, 12 Oct. 1968, *Hj. Eichler* 20202 (AD, CANB, PERTH).

Distribution and habitat. The new subspecies is known only from the vicinity of Starvation Boat Harbour east to Quagi Beach west of Esperance (Figure 1). The exact distribution has not been mapped. At the latter site it occurs notably on limestone rises north of the beach. A collection from 15 km south-west of Cape Riche (*Brooker* 6691, CANB) has fruit with a ± horizontal disc and lobes quite pronounced and is morphologically intermediate between the type form and subsp. *lobata*.

Conservation status. Possibly rare, but in need of further survey. It has been sampled once within Stokes Bay National Park, at Fanny Cove (*Aplin* 2650b). A Priority 2 taxon in the Department of Conservation and Land Management's Declared Rare and Priority Flora List. See end of this issue.

Flowering period. Unknown, but a few plants were in flower in November 1991. *Eichler* 20202, collected in October, has a single flower.

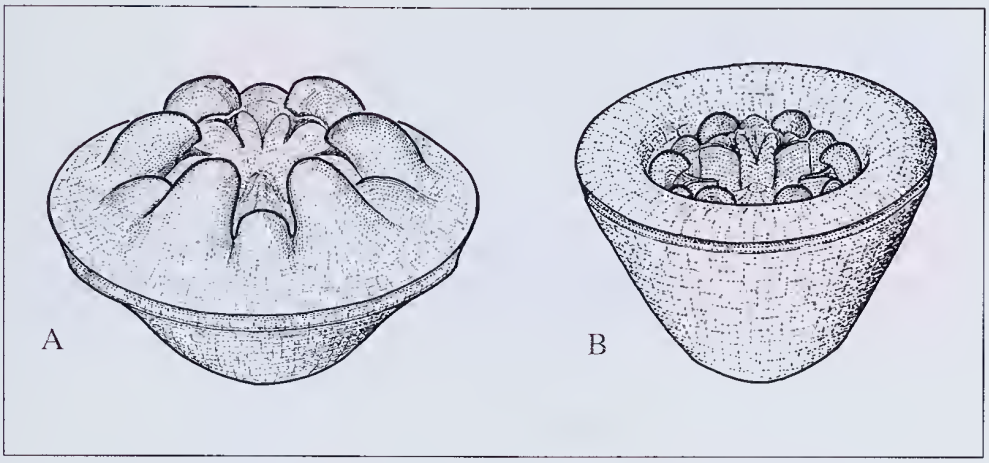

Figure 3. Fruit of A - *E. preissiana* subsp. *lobata* (*Brooker* 10909, type, near Quagi Beach) and B - *E. preissiana* subsp. *preissiana* (*Brooker* 8034, Stirling Range).

Etymology. From the Latin *lobatus* - lobed, referring to the lobes of the disc.

Notes. E. preissiana (type from Cape Riche) was discussed by Mueller in "Eucalyptographia" (1879). He gave the distribution as "extending at least as far as Stoke's Inlet (Maxwell)" without alluding to any pecularities of this eastern form.

Acknowledgements

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